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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/892,608	06/28/2001	Nawalage Florence Cooray	122.1457	4846

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EXAMINER

RIBAR, TRAVIS B

ART UNIT	PAPER NUMBER
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1711

DATE MAILED: 08/07/2002

9

Please find below and/or attached an Office communication concerning this application or proceeding.

T.P

Office Action Summary

Application No.

09/892,608

Applicant(s)

COORAY, NAWALAGE
FLORENCE

Examiner

Travis B Ribar

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on June 21, 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
2. Claims 1-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Murayama et al. in view of Smith et al. ('372).

Murayama et al. shows a fluorinated o-aminophenol polymer that fulfills the requirements set forth in claims 1 and 2 of the present invention with the exception of the inclusion of thermosetting end groups on the polymer. The compounds that Murayama et al. lists as components (column 4, line 6 to column 5, line 7) include some of the same materials used as polymer precursors in the present invention and fulfill the material properties set forth by the applicant in claims 1 and 2 (with the exception of the thermosetting end groups). The polymer that is created in Murayama et al. undergoes heat treatment to form a film (column 7, lines 18-26). The indication of a measurement of the dielectric constant of the resulting film (column 7, lines 27-32) shows that the film does constitute a suitable dielectric film. Finally, Murayama et al. teaches the common use of the created material as the insulating layer of a multilayer circuit board (column 12, line 66 to column 13, line 6).

Smith et al. ('372) claims the inclusion of thermosetting end groups onto polymers and monomers (Smith et al. ('372) claims 1 and 20) to enable crosslinking. Smith et al. ('372) also states that this technology may be used in polybenzoxazoles (Smith et al. ('372) column 22, line 64 to column 23, line 13). Some advantages of

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crosslinking a material in this manner are taught within Smith et al. ('372), including lower water sorption and high thermal strength (Smith et al. ('372) column 19, line 64 to column 20, line 47). Since the explicit purpose of adding the thermosetting end groups to a polymer in Smith et al. ('372) is to crosslink, or cure, the polymer by heating it (Smith et al. ('372) claim 1), it is apparent that the monomers shown in Murayama et al., end capped with thermosetting groups as in Smith et al. ('372), would cure when heated to form a dielectric film, fulfilling the applicant's claims 3-8. Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to put thermosetting end groups, as shown in Smith et al. ('372), on the monomers claimed in Murayama et al. in order to utilize the lower water sorption and higher thermal strength present in a crosslinked system as opposed to a non-crosslinked system.

3. Claims 1-4 and 6-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sezi et al. in view of Smith et al. ('372).

Sezi et al. discloses a polybenzoxazole made from fluorinated o-aminophenol (column 8, line 33 to column 9, line 46) and fluorinated aromatic dicarboxylic acid precursors (column 9, lines 47-53), meeting these parts of the applicant's claims 1 and 2. The precursors are polymerized via heat treatment (column 10, lines 59-65) to form dielectric sheets (column 1, lines 20-23), thereby meeting these parts of claims 3-4 and 6-7. Sezi et al. does not, however, teach the inclusion of thermosetting end groups on the precursors.

Smith et al. ('372) claims the inclusion of thermosetting end groups onto polymers and monomers (Smith et al. ('372) claims 1 and 20) to enable crosslinking. Smith et al. ('372) also states that this technology may be used in polybenzoxazoles (Smith et al. ('372) column 22, line 64 to column 23, line 13). Some advantages of crosslinking a material in this manner are taught within Smith et al. ('372), including lower water sorption and high thermal strength (Smith et al. ('372) column 19, line 64 to column 20, line 47). Since the explicit purpose of adding the thermosetting end groups to a polymer in Smith et al. ('372) is to crosslink, or cure, the polymer by heating it (Smith et al. ('372) claims 1 and 20), it is apparent that the monomers shown in Sezi et al., end capped with thermosetting groups as in Smith et al. ('372), would cure when heated to form a dielectric film, fulfilling the applicant's claims 3-4 and 6-7. Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to put thermosetting end groups, as shown in Smith et al. ('372), on the monomers claimed in Sezi et al. in order to utilize the lower water sorption and higher thermal strength present in a crosslinked system as opposed to a non-crosslinked system.

4. Claims 5 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sezi et al. in view of Smith et al. ('372) as applied to claim 1 above, and further in view of Murayama et al.

The combination of Sezi et al. and Smith et al. ('372) yields the polymer of claim 1. They do not teach, however, that the polymer can be used in a multilayer circuit board.

Murayama et al., discussed above, discloses that polybenzoxazoles are commonly used in multilayer circuit board applications. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use the polymer taught by the combination of Sezi et al. and Smith et al. ('372) in a multilayer circuit board. The motivation for doing so would be that it is well known in the art that such a polymer forms a dielectric film that is suitable for use in a multilayer circuit board. Therefore it would have been obvious to combine Murayama et al. with Sezi et al. and Smith et al. ('379) to obtain the invention as specified in claims 5 and 8.

Response to Arguments

5. Applicant's arguments with respect to claims 1-8 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the

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shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

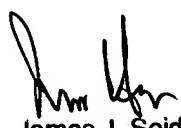
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Travis B Ribar whose telephone number is (703) 305-3140. The examiner can normally be reached on 8:30-5:00 Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James Seidleck can be reached on (703) 308-2462. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Travis B Ribar
Examiner
Art Unit 1711

TBR
July 29, 2002


James J. Seidleck
Supervisory Patent Examiner
Technology Center 1700